

**SPECIAL, EXCEPTIONAL, CRITICAL, OR UNIQUE INSPECTION  
POWERTECH (USA) INC.**

OPERATOR: Powertech (USA), Inc.  
PERMIT NUMBER: Pending Permit Application  
INSPECTION TYPE: Special, Exceptional, Critical, or Unique Lands Determination  
DATES: August 26, 2008 and October 8, 2008  
TIME IN/OUT: August 26, 2008 9:40 AM to 4:00 PM MST  
October 8, 2008 9:50 AM to 4:30 PM MDT  
INSPECTORS: Eric Holm, Mike Cepak, Roberta Fivecoate, Mark Keenihan, Mike  
Lees, Gary Haag, Tom Brandner, and Matt Hicks  
ACCOMPANIED BY: Frank Lichnovsky, Richard Clement, Richard Blubaugh, Len  
Eakin, Wyatt Van Eaton, Jim Munro, Amy Thurlkill, and Mark  
Hollenbeck (Powertech)  
Mike Fosha (State Archaeologist's Office)  
Jason Kruse and Rob Bozell (Augustana College)  
Cory Foreman (RESPEC)  
Stan Michals (Game, Fish, and Parks)  
Dan Benoit, Russ Pigors, and Elizabeth Stiller (Bureau of Land  
Management)  
Rusty Wilder, Laura Burns, and Lea (US Forest Service)  
Keith McConnell, William von Till, Gregory Suber, Alan  
Bjornson, James Park, and Joan Olmstead (Nuclear Regulatory  
Commission)  
Gary Walter, Patrick LaPlante, and Edgar Huber (Southwest  
Research Institute)

In accordance with ARSD 74:29:10:08(1), inspections of Powertech's proposed uranium in situ leach mine were conducted on August 26 and October 8, 2008. The inspection was conducted to determine whether the lands described in the recently submitted Request for Determination of Special, Exceptional, Critical, or Unique Lands and Notice of Intent to Operate should be included on the preliminary list.

The legal location of the proposed operation is as follows:

E1/2 NE1/4, E1/2 SE1/4, SW1/4 SE1/4, S1/2 NW1/4 SE1/4, SE1/4SW1/4, and S1/2 NE1/4 SW1/4 Section 20, W1/2, W1/2 W1/2 NE1/4, and W1/2 NW1/4 SE1/4 Section 21, S1/2 Section 27, N1/2 NW1/4, SW1/4 NW1/4, and SW1/4 Section 28, Section 29, Section 30, E1/2 Section 31, Section 32, NW1/4, SW1/4, SE1/4, and S1/2 NE1/4 Section 33, Section 34, and Section 35; T6S-R1E, Custer County

Section 1, Section 2, Section 3, W1/2 W1/2 Section 4, Section 5, Section 10, Section 11, Section 12, NW1/4, W1/2 NE1/4, and NE1/4 NE1/4 Section 14, and N1/2 Section 15; T7S-R1E, Fall River County

The proposed mining area is located about 13 miles northwest of Edgemont, South Dakota. Approximately 1,600 acres will potentially be affected by the mining operation and associated disturbance. The total acreage within the proposed permit boundary is about 10,580 acres. About 248 acres of BLM land are included in the permit boundary, with the remaining acreage on private land.

During the 10 to 15 year life of the in situ mining operation, Powertech will use injection wells to pump oxygen and carbon dioxide water into the ore deposit to dissolve uranium. Production wells will be used to pump the uranium-laden fluids to the surface. A typical well field will have 520 injection/recovery wells and 50 monitoring wells. Each mining unit will be a 10 acre plot along the uranium roll front. The fluids from the production wells will be processed at two separate facilities at the mine site to extract and concentrate the uranium. After uranium has been removed from each mining unit, the ground water will be returned to baseline conditions or will meet ground water quality standards. Any surface disturbance will be reclaimed to the current use of livestock pasture.

### **August 26, 2008 Inspection**

On August 26, 2008 at 9:40 AM MDT, the inspectors met with representatives of Powertech, RESPEC, the South Dakota Department of Game, Fish, and Parks (GF&P), the U.S. Nuclear Regulatory Commission (NRC), the Bureau of Land Management (BLM), and the Southwest Research Institute at the Powertech office in Edgemont, South Dakota. Representatives of the US Forest Service met us in the field later in the day. The following persons attended the meeting and inspection:

Mike Cepak, Eric Holm, Roberta Fivecoate, Mark Keenihan, Gary Haag, and Tom Bradner (DENR);  
Richard Clement, Frank Lichnovsky, Jim Munro, Wyatt Van Eaton, and Len Eakin (Powertech);  
Stan Michals (Game Fish and Parks);  
Cory Foreman (RESPEC);  
Dan Benoit, Russ Pigors, and Elizabeth Stiller (Bureau of Land Management (BLM));  
Rusty Wilder, Laura Burns, and Lea (US Forest Service);  
Keith McConnel, William von Till, Gregory Suber, Alan Bjornson, James Park, and Joan Olmstead (Nuclear Regulatory Commission (NRC)); and  
Gary Walter, Patrick LaPlante, and Edgar Huber (Southwest Research Institute).

Frank Lichnovsky of Powertech gave a brief presentation of the proposed operation to the group. He showed the group some maps with all of the exploration holes drilled in the 1970's along with the holes recently drilled by Powertech. The holes were clustered around the uranium ore deposits. Mr. Lichnovsky said the first well field for the in situ mining operation will be located in an ore zone near Burdock. He also showed the location of the Dewey satellite processing facility and the main processing facility near Burdock.



After the meeting, we drove to the proposed mining area. Along the way, we made a quick stop at the Hollenbeck Ranch to consolidate vehicles. We arrived at the Burdock area at 11:37 AM MDT. The first stop was an area just inside the gate just to the west of the county road in the NE1/4 Section 15; T7S-R1E (Photo 1). Powertech has conducted uranium exploration activities in the Burdock area under EXNI-404. Mr. Lichnovsky showed the ore trend in the area which extends from east of where the group stopped towards the southwest. He also showed the group one of the wells which was used in the recent pump test.



Photo 1 – Burdock area.



Photo 2 – First well field area.

We then overlooked the BLM area in portions of Sections 10 and 11; T7S-R1E at the request of the BLM. Vegetation in the area consisted mainly of prickly pear, buffalo grass, and brome grass.

The next stop in the Burdock area was SW1/4 Section 11; T7S-R1E where the May 2008 pump test was conducted. Powertech installed steel ranch style fence panels around the wells that were used in the pump test. A small pond was constructed to contain water from the pump test. Mr. Lichnovsky said this would be the area where the first well field would be established during mining (Photo 2). Gypsum was noted in the disturbed soils around the pump test area. Vegetation consisted of greasewood, prickly pear, wheatgrasses, and gumweed.

At this point, personnel from the Forest Service arrived. The group then proceeded to the Darrow-Neville abandoned uranium mine in Section 1; T7S-R1E (Photo 3). The abandoned mine has unreclaimed pits and waste rock piles and low pH water in some of the ponds in the pits.

At 12:40 PM MDT, we stopped on a small hill in the Burdock area that overlooked the proposed central processing area in W1/4 Section 2; T7S-R1E (Photo 4). The processing area will include a processing facility where the uranium ore in solution will be converted into a uranium oxide product. There were signs that burrowing animals are using the area. Vegetation consisted of sagebrush, prickly pear, little bluestem, blue grama, and wheatgrasses. One of the Darrow-

Neville pit lakes could be seen to the east of this area. Personnel from the US Forest Service decided to stay behind and inspect the Darrow-Neville Pit.



Photo 3 – Darrow-Neville Pit.



Photo 4 – Proposed plant site in middle of photo.

The group then proceeded to the Dewey area at 1:20 PM MDT. At this point, the NRC personnel departed to attend a prior commitment. As we proceeded north to the Dewey area, we drove over the Pass Creek bridge and noted the debris field from the recent Pass Creek flood. As we entered the Dewey area, we noted some signs identifying the area as a Cooperative Management area managed by the Department of Game, Fish and Parks and GCC Dakota, the surface owner (Photo 5). Other signs indicated that there was a Game, Fish, and Parks walk-in area in the vicinity.



Photo 5 – Cooperative Management sign.



Photo 6 – Proposed Dewey plant site.

At 1:40 PM MDT, we inspected the proposed satellite processing facility in the W1/2 Section 29; T6S-R1E (Photo 6). A prairie dog town was noted, and portions of it will be disturbed during construction of the satellite facility (Photo 7). One of the sites drilled under EXNI-404 (DB07-



29-5) was plugged and regraded, but did not appear to be seeded. Vegetative cover was sparse in this area and consisted of buffalograss and greasewood.

The last stop on the inspection was in NW1/4 Section 32; T6S-R1E where the Dewey pump test was conducted (Photo 8). As with the pump test in the Burdock area, Powertech installed steel ranch style fence panels around the wells that were used in the pump test. A small pond was constructed to contain water from the pump test. Vegetative cover was also sparse in this area and consisted mainly of buffalograss and weeds.



Photo 7 – Prairie dog hole in Dewey area.



Photo 8 – Dewey pump test area.

The prairie dog town previously mentioned extends into this area. The department told Powertech and RESPEC that the prairie dog town should be mentioned in the wildlife section of the scenic and unique application. Also, the cooperative management and walk in areas should be mentioned in the recreation section of the application. Stan Michals of Game, Fish, and Parks said the cooperative management area is only a voluntary contract between Game, Fish, and Parks and GCC Dakota and can be rescinded at any time.

Powertech has also submitted a uranium exploration application to conduct condemnation drilling in Sections 29, 30, and 32; T6S-R1E, Custer County and Sections 2, 10, and 11; T7S-R1E, Fall River County. The results of the inspection for the exploration permit are covered under a separate report.

We left the Dewey area at 2:15 PM MDT and headed back to the Hollenbeck Ranch for lunch and a presentation by Powertech. On the way, we noted another walk-in area on the east side of the county road in Section 29; T6N-R1E that should also be mentioned in the recreation section of the application.

After we arrived at the ranch, Mark Hollenbeck of Powertech joined us. After lunch, Jim Munro gave a presentation of the current plans for the processing facilities and Powertech's plans to restore the aquifers after mining is completed. The company may establish other satellite facilities in the Plum Creek and other potential mining areas. Dr. Munro said there may be some

elevated arsenic and selenium levels in the waste water from the process facilities. The company is looking at taking water out of the Madison or other aquifers to help restore the aquifers during final reclamation and constructing ponds to store water during the winter months.

After the presentation, we discussed the Request for Determination of Special, Exceptional, Critical, or Unique Lands. DENR told Powertech that it had a chance to briefly review the Request and found that the company did not address whether the area was ecologically fragile. Also, as mentioned in the field, DENR said Powertech should address the prairie dog town and the cooperative management and walk in areas in Sections 29 and 32:T6S-R1.

The meeting ended at 4:00 PM MDT.

### **October 8, 2008 Inspection**

A follow-up meeting and inspection was conducted on October 8, 2008. The following persons attended the meeting and inspection:

Mike Cepak, Eric Holm, Roberta Fivecoate, Mike Lees, and Matt Hicks (DENR);  
Richard Blubaugh, Frank Lichnovsky, Jim Munro, Amy Thurlkill, Mark Hollenbeck, and  
Len Eakin (Powertech);  
Mike Fosha (State Archaeologist's Office)  
Jason Kruse and Rob Bozell (Augustana College)  
Stan Michals (Game Fish and Parks); and  
Cory Foreman (RESPEC).

On October 8 at 9:50 AM MDT, a second special, exceptional, critical, or unique lands inspection of the proposed mining area was conducted to discuss with Mike Fosha of the State Archaeologist's office and consultants from Augustana College the potential for archaeologic sites in the proposed mining area. The inspectors met with the above mentioned representatives at the Powertech office in Edgemont.

At the meeting, Powertech submitted its response to the department's October 6, 2008 completeness letter for the "Request for Determination of Special, Exceptional, Critical, or Unique Lands". We discussed item no. 4 in the letter which dealt with Powertech not including all sections within the permit boundary, including sections recently added, in the various baseline reports. The department said the sections and the total permit boundary acreage listed in the baseline reports varied from report to report. Powertech said it would modify the reports so that they would all include the same sections and acreage.

We discussed locations of additional upgradient baseline wells in Section 21; T6S-R1E since the section has been added to the permit boundary after the Request for Determination was submitted in August. The additional wells are needed because Section 21 is upgradient of previously established upgradient wells.



Stan Michals of Game, Fish and Parks said when he compared wildlife studies of the area to the locations of the proposed drill areas under EXNI-409, a bald eagle nest was located within the proposed permit boundary in the Dewey area in SW1/4 Section 30; T6S-R1E. The bald eagle has been removed from the federal threatened and endangered species list, but it is still listed as a state endangered species.

We had a lengthy discussion on cultural and archaeologic aspects of the special, exceptional, critical, and unique analysis with Mike Fosha of the State Archaeologist's office and Jason Kruse and Rob Bozell of Augustana College who are Powertech's archaeologic consultants. Mr. Fosha said the site is culturally unique in the sense that each culture used the area for different things. However, 90 percent of the sites have been destroyed by erosion and cannot be studied. Mr. Fosha added that most of the sites surveyed are not considered unique, but some areas could be deemed unique after further study is completed. There are possible eligible sites in the southeastern part of the proposed mine permit area as well as in the pine hills area, including a possible burial site. More sites could be found in the new sections added to the proposed permit area. To help study the archaeological sites within the proposed permit boundary, Powertech will need to provide a more detailed mine plan to include the size of the footprint of disturbance during the mining operation. Three sites that have been determined as eligible for inclusion on the National Register of Historic Places will need to be marked with permanent survey markers so they are not disturbed.

Powertech gave an update on the mine permit application. The company plans to submit both the mine permit and UIC applications to the department sometime in December 2008. Regarding the General Environmental Impact Statement (GEIS), the Nuclear Regulatory Commission (NRC) said it is only going to extend the public comment period another 30 days. It expects the GEIS to be issued sometime in May 2009. The company also asked how it should address the abandoned uranium mines within the permit boundary in the permit application.

After a 45 minute lunch break, we resumed the meeting and discussed ground water restoration issues. The department told Powertech it has concerns with using water from the Madison aquifer to restore aquifers affected by in situ mining. The department prefers Powertech use only a minimal amount of water from the Madison aquifer. Powertech said it is considering using either one 200 gpm well or two 150 gpm wells in the Madison aquifer for restoration water. The remaining water would come from a reverse osmosis (RO) unit in the processing plant.

The department told Powertech a solid waste permit will not be required for disposal of restoration water. However, the department still has concerns over Powertech using land application to dispose of restoration water. State agencies in other in situ mining states report problems with land application of restoration water. Powertech said it will need to remove arsenic, radium, vanadium, and uranium from the water. After evaluating soils and water in the area, it appears that selenium will not be a problem. Also, legumes and alfalfa are good selenium accumulators.



Powertech said it is currently calculating the acreage per volume of restoration water needed for land application. The land application areas will be bermed and will be designed for zero discharge. Land application will not occur in any drainages. Cultural surveys have also been completed in the potential land application areas to ensure that no cultural resources will be impacted. An evaporation pond is also being designed to contain water from the RO unit. Any excess water will be hauled to Wyoming and disposed in a deep underground well.

Powertech's 30 hole exploration permit application was also discussed during the meeting, and a summary of the discussion can be found in Powertech's EXNI-409 inspection report.

The meeting ended at 12:27 PM MDT. We then proceeded to the Burdock area and arrived at 12:57 PM MDT. The main purpose of the inspection was to look at various cultural and bird nesting sites within the proposed permit boundary. Antelope were noted in the area at the time of the inspection. We inspected a couple of archaeologic sites. One area that was not eligible for inclusion on the National Register of Historic Places had some flint chips (Photo 9). Another area consisted of a 5,000 year old fire hearth (Photo 10). However, because the hearth was eroded and exposed to the elements, it was considered not eligible for inclusion on the National Register of Historic Places. The area of the first stop was also a long-billed curlew nesting area.



Photo 9 – Flint chip site.



Photo 10 – Fire hearth.

As we proceeded through the Burdock area, we stopped at an ancient fire hearth located in one of the pine hills areas (Photo 11). Both Mr. Fosha and the consultants from Augustana said that this area will need more evaluation. Powertech does not plan on affecting this area for four or five years, so there will be time to further evaluate this area.

We then stopped at the proposed central processing area. Details on this area were previously described in the August 26 inspection summary. A prairie dog town was noted in this area (Photo 12).

The final stop on the Burdock inspection was a possible homesteader burial site (Photo 13). Mr. Fosha and the consultants from Augustana thought that the way the pile of rocks were arranged,



it resembled a grave site for a homesteader. A nearby elderly rancher remembered a homesteader being buried in this area. Remains of an old pump house were also noted near the suspected grave (Photo 14).



Photo 11 – Fire hearth.



Photo 12 – Burdock prairie dog town.



Photo 13- Possible burial site.



Photo 14 – Remains of old pump house.

As we left the Burdock area, we noted some antelope hunters.

We arrived in the Dewey area at 2:38 PM MDT. After a brief stop at the prairie dog town mentioned in the August 26 inspection summary, we proceeded to the bald eagle nest that was mentioned during the meeting (Photo 15). There is a house just to the north of the nest (Photo 16). The area around the nest was very weedy with some sagebrush and prickly pear scattered through the area. Antelope were noted to the east of the nest (Photo 17).



The last stop on the inspection was an area with several fire hearths that has the potential to be eligible for inclusion on the National Register of Historic Places. The hearths were located in a small intermittent drainage near Beaver Creek (Photo 18). A few hearths were exposed as they were eroding out of a stream bank. Vegetative cover consisted of greasewood, sage brush, little bluestem, prickly pear, and some weeds. Mr. Fosha and the consultants from Augustana said some trenches will need to be dug in the area to define the size of the archaeological site. Mr. Fosha thought this could be a significant archaeological site. However, since there is not much information on the site, he did not feel that it would be considered special, exceptional, critical, or unique at this time. He also felt that if this is a significant archaeological site, it could be protected by permit conditions.



Photo 15 – Eagle nest in tree.



Photo 16 – House in background.



Photo 17- Antelope in Dewey area.



Photo 18 – Fire hearth.

The inspection ended at 3:40 PM MDT. We then proceeded to the Hollenbeck Ranch to conduct a close-out meeting. The consultants from Augustana will send the department updated archaeological maps of the proposed permit boundary area and tables that will summarize each



archaeological site on the maps. The department said the maps will be kept confidential, but the tables will not be marked confidential since they do not include locational information.

Powertech asked if the state would require an environmental impact statement (EIS) in addition to the mine permit application. The department said no state EIS would be required since many of the items required in an EIS would be addressed in the mine permit application. Also, an EIS will probably be required for the federal permits.

After discussing archaeologic issues with the 30-hole exploration permit application, the close-out meeting ended at 4:30 PM MDT.

## **COMMENTS/RECOMMENDATIONS**

Note: The following represents only the recommendations and observations made by the Department of Environment and Natural Resources in determining whether this area should be included on the Preliminary List of Special, Exceptional, Critical, or Unique Lands. Each subsection of SDCL 45-6B-33.3 has been addressed as part of the department's analysis. It should be noted that the Department of Game, Fish and Parks, the Department of Tourism and State Development, the Office of History, the Department of Agriculture, and the State Archaeologist did not recommend that the area be included on the preliminary list. Some of these agencies' comments have been included in this report.

### **1. ECOLOGIC FRAGILITY:**

The lands to be affected by the proposed mining operations should not be so ecologically fragile that once affected by mining, they could not return to their former ecological role in the reasonably foreseeable future with the application of proper reclamation techniques.

Overall, the proposed area is poor to good quality rangeland which is similar to the adjacent area. The vegetation in this area consists of western wheatgrass, buffalograss, green needlegrass, sagebrush, and prickly pear. These grasses are common in most western South Dakota prairies. Powertech proposes to return the area to rangeland after mining is completed. No threatened, endangered, or sensitive vegetative species were noted during the inspection or in the vegetative survey.

Beaver Creek, a tributary of the Cheyenne River, flows through the western portion of the Dewey area and about one mile west of the Burdock area. Pass Creek, an intermittent tributary of Beaver Creek, flows along the western edge of the Burdock area. Bennett Canyon, an intermittent tributary of the Cheyenne River, flows along the eastern end of the Burdock area. Impacts to the creeks should be minimal given proper erosion control. No aquatic species of concern were noted in aquatic surveys of the two streams.

No federally listed threatened or endangered species were noted during the inspection or in the proposed mine area during the wildlife survey. Bald eagles were removed from the federal threatened and endangered species list in July 2007. However, the bald eagle is still listed as a state endangered species. A bald eagle nest was noted in a cottonwood tree in SW1/4 Section 30; T6S-R1E. Also, the following species in the wildlife survey (long-billed curlew, golden eagle, merlin, Cooper's hawk, American white pelican, and long-eared owl) are sensitive species that have been noted in the proposed mining area. None of these species were noted during the inspections. However, department inspectors found a long-billed curlew in the proposed mining area during a May 13, 2008 inspection.

Antelope and prairie dog towns were noted in both the Dewey and Burdock areas during the inspections. Antelope hunters were noted around the Burdock area during the October 8 inspection. The disturbance here will be temporary and there is abundant antelope habitat around the proposed mine site. Portions of the prairie dog towns will be disturbed during construction of the processing facilities and during mining. Black footed ferrets, which are the only federally threatened or endangered species that could potentially occur in the area and can be found in prairie dog towns, were issued a block clearance for the state of South Dakota by the US Fish and Wildlife Service.

The Department of Game, Fish, and Parks had no comments on the Request and did **not** recommend that the area be placed on the preliminary list.

2. **INFLUENCE OF THE AREA ON ITS ECOSYSTEM:**

The temporary effects on the lands in the proposed area should not precipitate a system-wide ecological reaction of unpredictable scope or dimension.

Overall, the proposed area is poor to good quality rangeland which is similar to adjacent areas. The vegetation in this area consists of western wheatgrass, buffalograss, green needlegrass, sagebrush, and prickly pear. These plants are common in most western South Dakota prairies. Powertech proposes to return the area to rangeland after mining is completed. No threatened, endangered, or sensitive vegetative species were noted during the inspection or in the vegetative survey.

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endangered species. A bald eagle nest was noted in a cottonwood tree in SW1/4 Section 30; T6S-R1E. Also, the following species in the wildlife survey (long-billed curlew, golden eagle, merlin, Cooper's hawk, American white pelican, and long-eared owl) are sensitive species that have been noted in the proposed mining area. None of these species were noted during the inspections. However, department inspectors found a long-billed curlew in the proposed mining area during a May 13, 2008 inspection.

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The Department of Game, Fish, and Parks had no comments on the Request and did **not** recommend that the area be placed on the preliminary list.

3. The proposed area does not possess any of the following significant characteristics:

**SCENIC:**

No areas of scenic significance were noted during the inspection. The Department of Tourism and State Development had no comments on the Request and did **not** recommend that the area be placed on the preliminary list. The area consists mainly of rangeland with some scattered areas of ponderosa pine. It is no different from many other rangeland ecosystems around the perimeter of the Black Hills in western South Dakota. Portions of the mine will be visible from Dewey Road and the adjacent railroad. The proposed mining area is about 13 miles north of Highway 18 and the city of Edgemont and will not be visible from either the highway or the city.

There are a few ranch houses near the proposed permit boundary. Portions of the operation will be visible from these houses.

Craven Canyon, which was placed on the preliminary list of special, exceptional, critical, or unique lands in 1991, is located more than 5 miles east of the proposed permit boundary. It will not be affected by the proposed operation, and the operation will not be visible from Craven Canyon.

**HISTORIC, ARCHAEOLOGIC, CULTURAL, ETHNOLOGIC:**

No items of historic significance were noted during the inspection. The Office of History had no comments and did **not** recommend that the area be placed on the preliminary list.

Mike Fosha of the State Archaeologist office determined that the sites being impacted during the proposed mining operation do not contain sufficient information that would exhibit special, exceptional, critical, or unique lands criteria from a historic, cultural, archaeologic, or ethnologic perspective. There are 190 cultural resources identified to date in the proposed permit boundary. Of these resources, 110 of them have been evaluated or are not considered to contain significant cultural or archaeological data and require no further evaluation. The majority of these sites are light lithic scatters where the reduction of tool manufacturing took place, while other sites suggest longer duration occupations by the presence of stone filled pits and hearths. In addition, many of these sites have been completely eroded, exhumed, and reburied or occur on topographic features that receive constant erosion.

There are two Euro-American sites (39CU2000 and 39FA2000) which involve a railroad and two prehistoric sites (39CU271 and 39CU3592) that are potentially eligible for inclusion on the National Register of Historic Places. These sites will be avoided during mining. Site 39CU3592 consists of several hearths and needs additional evaluation which was noted during the inspection. Currently, the site is not within the proposed affected area of the mining project. However, since the site is close to the primary ore body, Mr. Fosha requested a 50 foot buffer around the site during the mining operation. If this is not possible, some trenches will need to be dug to define the size and extent of the archaeologic site. One possible Euro-American burial site noted during the October 8, 2008 inspection will be required to be avoided during mining.

There are 76 archaeological sites that have not been evaluated for archaeologic or cultural significance. However, a memorandum of understanding between Powertech and the Archaeological Research Center provides adequate protection for these sites. It requires Powertech to evaluate these sites at least 30 days prior to any disturbance. If any significant sites are found, Powertech would have to avoid these sites or provide mitigation to protect these sites.

#### **TOPOGRAPHIC:**

There were no areas of topographic significance noted during the inspection. The area is along the southwestern edge of the Black Hills. The topography varies from the higher elevation edge of the Black Hills to the north and east to the flat range land to the west and south. It is no different from many other landforms along the edge of the Black Hills.

Beaver Creek, a tributary of the Cheyenne River, flows through the western portion of the Dewey area and about 1 mile west of the Burdock area. Pass Creek, an intermittent tributary of Beaver Creek, flows along the western edge of the Burdock area. Bennett Canyon, an intermittent tributary of the Cheyenne River, flows along the eastern end of the Burdock area.



### **GEOLOGIC:**

Nothing of geologic significance was noted during the inspection. The stratigraphy in the region consists of Precambrian rocks near the center of the Black Hills Uplift. Rocks range in age from Cretaceous through recent. In situ mining for uranium will occur in the Fall River and Lakota Formations of the Inyan Kara Group. The Inyan Kara Group consists of complexly interbedded sandstone, siltstone, and claystone. The Inyan Kara is overlain by the Skull Creek Shale of Lower Cretaceous age and underlain by the Morrison Formation of Jurassic age. The geology in the area is not considered unique as it is found in other areas of the Black Hills.

The Fall River and Lakota Formations of the Inyan Kara Group also comprise the focus of the Inyan Kara Aquifer. The aquifer found within this area contains elevated levels of uranium, radium, radon, TDS, and sulfate. The levels of uranium, radium, and radon within the water makes this water unusable based on state ground water standards and federal drinking water standards.

The next deepest recognized regional ground water aquifer is the Minnekahta Aquifer which is more than 500 feet and possibly more than 1000 feet deeper than the Inyan Kara Aquifer. These aquifers are separated by large quantities of materials with lower permeability such as the shales of the Spearfish Formation so communication between this aquifer and other regional aquifers is highly unlikely.

### **SCIENTIFIC:**

No items of scientific significance were noted during the inspection. As explained earlier in this report, Mike Fosha of the State Archaeologist office determined that the area did not meet the criteria for special, exceptional, critical, or unique lands from a cultural perspective.

The Department of Game, Fish, and Parks and the Department of Agriculture did **not** recommend that the area be placed on the preliminary list. No federally listed threatened or endangered species were noted during the inspection or in the proposed mine area during the wildlife survey. Bald eagles were removed from the federal threatened and endangered species list in July 2007. However, the bald eagle is still listed as a state endangered species. A bald eagle nest was noted in a cottonwood tree in SW1/4 Section 30; T6S-R1E. Also, the following species in the wildlife survey (long-billed curlew, golden eagle, merlin, Cooper's hawk, American white pelican, and long-eared owl) are sensitive species that have been noted in the proposed mining area. None of these species were noted during the August 26 and October 8 inspections. However, department inspectors found a long-billed curlew in the Burdock area during a May 13, 2008 inspection.

Antelope and prairie dog towns were noted in both the Dewey and Burdock areas during the inspections. Antelope hunters were noted around the Burdock area during the October 8 inspection. The disturbance here will be temporary and there is abundant

antelope habitat around the proposed mine site. Portions of the prairie dog towns will be disturbed during construction of the processing facilities and during mining. Black footed ferrets, which are the only federally threatened or endangered species that could potentially occur in the area and can be found in prairie dog towns, were issued a block clearance for the state of South Dakota by the US Fish and Wildlife Service.

**RECREATIONAL:**

No areas of recreational significance were noted during the inspection. The Department of Tourism and State Development had no comments on the Request and did **not** recommend that the area be placed on the preliminary list. The area is primarily used for livestock grazing. Recreational use is limited to trapping and deer and antelope hunting which has been restricted on private lands. Antelope hunters were noted in the area during the October 8 inspection. Less than one percent of the total area open to hunting will be closed during mining operations.

In the Dewey area, there is a Cooperative Management Area administered by the Department of Game, Fish and Parks and GCC Dakota who is the surface owner. The area may also be a Game, Fish, and Parks walk-in area.

No items of any significance were noted during the inspection. All of the state agencies which reviewed the Determination felt that the area did not meet the criteria for special, exceptional, critical, or unique lands. Also, no nominating petitions were submitted by the review agencies. Therefore, the lands described in the Notice of Intent to Operate are **not** considered eligible for inclusion on the preliminary list of special, exceptional, critical, or unique lands. The proposed area should **not** be included on the preliminary list of special, exceptional, critical, or unique lands.

Petitions to nominate the proposed mine area to the preliminary list of special, exceptional, critical, or unique lands were submitted on December 28, 2008 by the Oglala Sioux Tribe and Debra White Plume and on December 29, 2008 by the Defenders of the Black Hills (Charmaine White Face). A hearing on the petitions will be held before the Board of Minerals and Environment in February 2009.

Inspector \_\_\_\_\_ \s/

Date: December 17, 2008